



Digitized by the Internet Archive
in 2015

<https://archive.org/details/b21362336>

Smallpox and Vaccination
Proposed on Vaccination

PROPOSAL

TO

STAMP OUT SMALL-POX

AND OTHER CONTAGIOUS DISEASES

BY

SIR J. Y. SIMPSON, BART. M.D. D.C.L.

PRESIDENT OF THE PUBLIC HEALTH SECTION OF THE NATIONAL ASSOCIATION
FOR THE PROMOTION OF SOCIAL SCIENCE.

THIRD EDITION.

EDINBURGH

EDMONSTON AND DOUGLAS

1868

12464

(From the Medical Times and Gazette of 4th and 11th January 1868.)

PRINTED BY R. CLARK, EDINBURGH

PROPOSAL TO STAMP OUT SMALL-POX, AND OTHER CONTAGIOUS DISEASES.

IN despite of the marvellous protective influence of vaccination, the mortality produced by small-pox in Great Britain is still very great and startling. Like other contagious maladies, it varies much in the number of its victims from one year to another; yet, during the ten years from 1856 to 1865, small-pox destroyed in this island 51,034 individuals. In one of the last of these years, 1863, not less than 7610 died from it; and in 1864 its amount of mortality reached to 9425.

Such figures as these numerals denote scarcely convey to the mind an adequate idea of the deplorable loss of life still resulting among us from the ravages of this one malady; the more so as the mortality from the disease is distributed through the whole scattered population of the island. But (to state it otherwise) if in any one year some overwhelming catastrophe destroyed all the living population of the counties of Nairn or Kinross—or swept away every living inhabitant of the cathedral cities of Lichfield, Ripon, or Wells—or slaughtered four or five regiments of soldiers—or smothered as many as five or six times the number of members of the House of Commons—such an event would assuredly appal and terrify the public and its guardians; and the strongest measures would, no doubt, be called for with the view of preventing the recurrence of the catastrophe, provided its prevention were at all possible. Is the similar amount of human slaughter to which our popu-

*Mortality
from Small-
pox.*

*Compari-
sons.*

*Preventible
Mortality.*

lation is constantly subject by small-pox—not once, but continuously—not one year, but each year—preventible? I believe that it is so ; and I believe further, that the hygienic measures required for effecting this prevention would be found neither specially difficult nor expensive to the country, while they would save annually hundreds, if not thousands, of our population from death by a disease which, even when it spares life, too often leaves permanent lesions and a broken and damaged constitution.

*Modes of
Propaga-
tion.*

To understand the means to which I point, let it be premised that small-pox is—like scarlet fever, measles, and hooping-cough—only a species of disease which, as a general law, attacks once in a lifetime, and is only propagated from an infected individual to a susceptible individual by a specific poison generated in the course of the malady and transmitted from the affected to the healthy—first, by the near approach of the one to the other ; secondly, by their contact ; thirdly, by direct inoculation ; or, fourthly, by fomites, or by susceptible individuals being exposed to the virus when it has been imbibed into clothes, etc., with which the sick have been in contact. We would no more expect this known species of disease or poison to originate *de novo* at the present day, under any combination of circumstances, than we would expect a known species of animal or plant—as a dog or a hawthorn—to spring up *de novo*, and without antecedent parentage.

*Causes of
Continu-
ance.*

The beneficial influence of Dr. Jenner's immortal discovery saves from death from small-pox, in our present population in Great Britain, probably about 80,000 lives yearly. As we have already stated, however, there still die from its ravages about 5000 annually. Some among these 5000 have been duly vaccinated, and yet are susceptible of small-pox after cow-pox, just as men formerly were found susceptible of a second attack of small-pox after they had passed through a previous attack of natural or inoculated small-pox. Others seem sus-

ceptible in consequence of the vaccination having been performed inadequately with imperfect matter ; or without leaving vaccination scars of sufficient quality or quantity. Again, a large class of those that perish from small-pox consists of individuals who have never been vaccinated at all, or who happen to be exposed to the variolous poison antecedent to the age at which vaccination is usually performed. Doubtless a stricter enforcement of the new compulsory laws of vaccination, and a greater amount of attention to its proper performance with proper matter, will betimes diminish the number of the susceptible class. Yet, in the meantime, the disease still revels with fatal power among our population ; and the question is, Can it be arrested in its progress ?

The public mind has during the last two or three years become familiarised with the idea of “*stamping out*” a disease, in the instance of Rinderpest—a malady apparently spreading in this country, as small-pox does, by contagion only ; and every one well knows the perfect success with which this affection has been lately banished out of England, while it has also, by due care, been prevented spreading to Ireland and the Isle of Man. I believe the same principle of stamping out could be as successfully applied to the extirpation of small-pox among us as it has been applied to the extirpation of rinderpest ; but of course with great differences. The rinderpest has been stamped out by killing all the animals labouring under the disease ; and in many instances all those animals of the same flock which had been exposed to the contagion of it, but which were not yet attacked by the malady. The mission, however, of the human physician is ever to save life, never to destroy it. And yet, in accordance with this leading and divine principle, we could, in my opinion, as surely and as swiftly stamp out small-pox as rinderpest has been stamped out. For all that appears necessary for the purpose is simply the methodic temporary

*Imperfect
Vaccina-
tion.*

*Stamping
out of Rin-
derpest.*

*Isolation
as the
means.*

seclusion, segregation, or quarantine, of those affected with small-pox, until they have completely passed through the disease and lost the power of infecting and injuring others. The poleaxe was the chief and leading measure required to stamp out renderpest. ISOLATION is the chief and leading measure required to stamp out small-pox.

*Rules for
Stamping
out.*

Various rules and arrangements would be necessary to effect the requisite amount of isolation. Without at all entering into details, let me here observe that the following measures would perhaps form the chief points to be attended to in the way of

REGULATIONS.

- 1st. The earliest possible notification of the disease after it has once broken out upon any individual or individuals.
- 2d. The seclusion, at home or in hospital, of those affected, during the whole progress of the disease, as well as during the convalescence from it, or until all power of infecting others is past.
- 3d. The surrounding of the sick with nurses and attendants who are themselves non-conductors or incapable of being affected, inasmuch as they are known to be protected against the disease by having already passed through cow-pox or small-pox.
- 4th. The due purification, during and after the disease, by water, chlorine, carbolic acid, sulphurous acid, etc., of the rooms, beds, clothes, etc., used by the sick and their attendants, and the disinfection of their own persons.

Here, as elsewhere, to obtain a great public good, some private or individual inconvenience must for the time be

undergone by those who unfortunately become the subjects of the disease. But since first publicly speaking of the stamping out of small-pox, I find that in 1867 the Legislature has passed the "Public Health Act" of Scotland, a most excellent measure,* which gives some of the leading powers required to enforce a series of regulations like the preceding. The Sanitary Act of 1866 for England and Ireland tends in the same direction, but is not so comprehensive. For the "general prevention and mitigation" of infectious diseases, and other purposes, the Scottish Act has erected a number of local boards everywhere throughout Scotland, consisting, according to circumstances, of the town-councils, of the police-commissioners, or of the parochial boards. These "local authorities" are each entrusted with the power of appointing sanitary inspectors and medical officers under them, and are themselves so far under the central control and advice of the "Board of Supervision." They are bound to provide district hospitals or temporary places for the reception of the sick; to remove to them, by suitable carriages, any person suffering from contagious or infectious disorders; in case of need to direct not the sick to be removed, but to remove all other unaffected persons surrounding them, providing suitable accommodation for these unaffected elsewhere; and to have in each district all necessary apparatus and attendants for the disinfection of woollen and other articles, clothing or bedding, which may have become dangerous from contact with diseased individuals. Such powers are of the highest importance for the protection of the general community against small-pox and other such infectious diseases among the poorer classes of the population; but regulations in the same spirit would equally benefit the highest and richest in the land, both individually and collectively, and the sick as well as the uninfected; the neces-

*Scottish
Sanitary
Act.*

*Its pro-
visions.*

* The Public Health Act for Scotland has lately been published by the Messrs. Blackwood, with notes by Sheriff Monro.

sary amount of isolation of the sick being, of course, allowed to all who wished it, and could afford it, to be effected at their own homes.

*Should we
enforce
Isolation?*

The Legislature has no scruple in interfering in some other diseases to as great or indeed to a greater extent. It enforces, for instance, the isolation of any individual affected with insanity, be he rich or poor, who is a homicidal lunatic, endangering the lives of others. If, by a law which no one thinks harsh or severe, lunatics are prevented from destroying the lives of their fellow men, why should it be thought harsh or severe that people affected with small-pox should be prevented from dealing out destruction and death to all the susceptible with whom they happen to come in contact? Homicidal lunatics do not destroy annually in Great Britain above eight or ten, on an average, of their fellow men. Small-pox patients yearly destroy, on the contrary, hundreds instead of units of their fellow men in this island. Sixty years ago, when speaking in the House of Commons of the gross iniquity of inoculating with small-pox the out-patients of a London hospital and then allowing these inoculated persons to infect others with the disease, Mr. Sturges Bourne strongly but truly remarked:—"I think that the Legislature would be as much justified in taking a measure to prevent this evil by restraint, as a man would be in snatching a firebrand out of the hands of a maniac just as he was going to set fire to a city." A rattlesnake or a tiger escaping from a travelling menagerie into a school full of children would, in all probability, not wound and kill nearly so many of these children as would a boy or girl coming among them infected with, or still imperfectly recovered from, small-pox, or scarlet fever, or measles, or hooping-cough. Most properly the cobra and the tiger—because they are *always* dangerous—are always, as far as possible, prohibited from making such visitations; and the infected boy or girl should be prohibited also, *during the time*

*Compari-
sons.*

that they are dangerous, by running through the course and convalescence of such contagious diseases ; or, in other words, while they exhale from their bodies a virus of disastrous and deadly potency.

The great object of preventing the diffusion of small-pox in any city, or village, or hamlet, by the stamping-out measures which I have ventured to suggest in this communication, would consist, of course, chiefly, when practicable, in isolating the very first cases. Some time ago a professional friend, to whom I was explaining these views, objected to them, that in the case of the town of Leith, which was the habitat of small-pox in 1861 and 1862, the disease was at one time too diffused to apply them. Dr. Paterson of Leith, however, has kindly informed me that at the time of the visitation of the malady, he made an official inquiry into its origin, and found it to be this :—A beggar woman, on tramp from Newcastle, brought, in the course of her wanderings to Leith, a child lately affected with small-pox, and with the crusts of the eruption upon it. In Leith she became an inmate of a lodging-house in a “land” or block of buildings full of lodgings for the poorest of the poor. Many of the lodgers in these other houses, with their children, visited the room where the woman and the sick child resided. By the time Dr. Paterson was requested by the magistrates to inspect the tenement, several persons were already dead of small-pox caught from this imported case. One man, who had already in previous life suffered from two attacks of small-pox, visited the infected tenement, and sickened and died of a third attack of the malady. The disease soon spread to other parts of Leith ; and, as I am informed by the registrar of that town, ninety-nine human beings were destroyed by it, and much suffering and sickness produced among the many hundreds in the town who caught the disorder and recovered. But if that first case

*Slaughter
at Leith by
one child.*

or cases had been obliged to be reported on at once, and had been forthwith isolated in the hospital or elsewhere, all this unnecessary amount of human mortality and disease would have been avoided ; nor would the isolation and maintenance of the first case, or of the first ten or twenty cases, have cost as much money as the purchase of the coffins for the ninety-nine who died. The blowing-up of the powder magazine in the fort at Leith would not likely produce nearly so much danger and destruction of life among the inhabitants of Leith as the advent of the beggar woman and her infected child. Yet how carefully do we guard against the one danger, and how carelessly do we treat the other !

Expense of Isolation.

One child kills 530 at Norwich.

In 1818-19, above 3000 individuals were attacked with small-pox in Norwich, or about a thirteenth part of the whole population of that city. Of those attacked, 530 died. The disease was originally introduced into the town, according to Mr. Cross, by a girl who, in travelling with her parents from York to Norwich, was exposed to small-pox at a market-town in the course of her journey ; and the malady appeared on her as soon as she arrived in Norwich. This was in June 1818. In January 1819, a druggist gave a new impulse to the contagion by inoculating three children with the small-pox. The disease destroyed in Norwich, according to Mr. Cross, more human life in the same space of time than had ever taken place from any other cause than the plague. The isolation of the girl first affected, and the prevention of the artificial inoculation of the three children by the druggist, would have prevented all this frightful mortality. To inoculate any one nowadays artificially with small-pox—as the druggist did—has for many years been established by Act of Parliament as a crime, inasmuch as it tends to imperil the destruction and death of others. Should it not be equally regarded as a crime for a community to allow of a case in their midst (such as that of the girl first affected at Norwich)

to remain in circumstances allowing of the deliberate dissemination and unchecked spread of the disease from her to others?

My friend Dr. Stark, who takes such diligent superintendence of the death registration in Scotland, tells me that constantly—as in these cases at Leith and Norwich—he hears, through his official returns, of small-pox spreading in districts here and there from one imported central case. *Imported cases.*

In order to stamp out small-pox, the first of the four regulations which I have ventured to lay down (see p. 6), as to the earliest possible notification of the presence of the disease, is indispensably essential. The “Public Health Act” for Scotland enacts that the keeper of any common lodging-house shall, when any of its inmates are ill of fever, or of any infectious disease, “give *immediate* notice thereof,” either to the medical officer, or the inspector of the poor, or the inspector of lodging-houses, in order that the medical officer shall forthwith visit and report on the case, and due means of prevention be taken by the “Local Authorities.” *Early notification.*

It would surely not be reckoned too hard a measure for the public safety that every householder should—by himself or through his medical attendant—be obligated by the Legislature to report upon the existence of any case of small-pox that might appear in his establishment. In the same spirit, every medical practitioner might be bound to report immediately any example of the disease that he met with in practice. All, or almost all, cases of small-pox could thus be brought under official notice comparatively early in the progress of the malady. As the disease does not mature into the stage of infection for some days after the eruption shows itself, a free period would thus be secured for arranging proper measures of isolation, either at home or in hospital, before the date and danger of infection were reached.

*Avoidance
of late in-
fection.*

Further, with the view of preventing the infection of others by patients that have passed through small-pox or its perils, it will ever be a matter of importance to prohibit and prevent the possibility of infecting others till the power of infection is exhausted. Small-pox patients have apparently the power of dealing out the disease to others, as long as any parts of the incrustation of the eruption are left on their faces, hands, or body. Until that time, and it may be a few days longer, segregation from the susceptible is necessary ; and no doubt would be followed by every person of proper feeling, for who would inflict, or run the chance of inflicting, disease and death on his fellow-beings? If he gives the infection even to one individual only, from that individual it may possibly become multiplied and propagated to hundreds. And before mixing again in society, the persons of the sick, as well as of the attendants, should perhaps—as already suggested—be subjected to bathing and some systematised disinfection. Like other physicians, I have heard of various cases of small-pox and other infectious diseases propagated from the sick at an advanced period of their own convalescence. Several instances have been communicated to me of beggars, in the streets of Edinburgh and elsewhere, importuning for charity by lifting up their children, with small-pox incrustations still upon them, almost against the very faces of those from whom they asked alms, and infecting with the malady those whom they subjected to this outrage. Not long ago, a woman—as I am informed by Professor Gairdner—with her face and hands incrustated with small-pox, was seen selling sweetmeats to the children of a school in Glasgow. I have heard of repeated instances of small-pox obtained by riding in public carriages, which had been employed immediately before by persons still in the stage of convalescence from the malady.

*Legislative
protection.*

The Sanitary Acts of England, Scotland, and Ireland, ought in a great measure to protect the lieges against such abuses for the

future, as they forbid, under a penalty, any persons suffering from infectious disorders (as small-pox, hooping-cough, etc.) from entering a public conveyance, or wilfully exposing themselves in any street or public place, or being exposed by others in any street or public place, without proper precautions against spreading the disease.*

The late stamping-out of rinderpest proved a most successful, but, at the same time, a most expensive proceeding. The disease, and the poleaxe as a means of extirpating it, have, I am informed, cost cattle-proprietors and the country—in the price of the animals destroyed—a sum of about £2,000,000 sterling. To stamp out small-pox from amongst us, and thus save annually hundreds and thousands of human lives by its

*Expense of
Stamping
out.*

* Other infectious diseases are often spread in very *advanced* stages of convalescence; and lives are constantly destroyed by not remembering and acting upon this all-important fact. I was lately told of a rich merchant-prince building himself a palace in the country. Scarlet fever broke out in the family of one of his gatekeepers shortly after he took up his residence. A certain amount and length of separation was enforced, but not enough; for at last one of the gatekeeper's children, in an advanced stage of convalescence from the disease, was allowed to come to him and deliver a letter. In consequence of this unfortunate communication the merchant himself sickened and died of the scarlatina. Some years ago I lost a dear friend and patient of measles, which broke out three days after her accouchement. She had come thousands of miles to be under my care. She was infected thus:—A girl came to beg at the door of her country residence, near Edinburgh. The girl stated she had been in hospital with measles, and had been dismissed when still too weak to work. The servant who conversed with the girl took measles, and gave it to some of the children. I brought my patient herself into Edinburgh as soon as possible, as she had never had measles, and all the eruptive fevers are, it is well known, almost always fatal when they attack the puerperal mother. But it was too late. I wrote her husband by one mail saying she was quite well, but I was in great fear of her from this exposure. For two days after delivery she was inclined to hold all the precautionary measures as utterly unnecessary; but the third day the fatal disease attacked her, and I was obliged to write her husband by the next mail the sad news of her death. The new-born child took measles, but recovered.

*Infectious
during ad-
vanced con-
valescence.*

extirpation, would require no such sum as was expended on the extinction of the cattle-disease, and, indeed, would require little or truly no outlay beyond what the Legislature has already enacted, and exacts for the protection of the public health; for, as previously stated, much of the machinery for its extirpation already exists under the late Sanitary Acts of Great Britain and Ireland. The segregation of those affected with small-pox who belong to classes which are able to keep the sick member or members of their family at home, would, of course, cost the country nothing; while the rules applicable to their isolation could, if faithfully followed, be managed without any special inconvenience or any injury to their feelings; and generally, if not always, under the superintendence and responsibility of their own medical attendants. These regulations would involve no restrictions that are not followed out at present in every well-regulated family when infectious disease attacks any of its members; none, indeed, except such as common prudence and common humanity demand for the protection of the bodies and lives of those that are still happily unaffected. Any open breach of rules that tended deliberately to spread the disease, and endanger and destroy the health and lives of others, would of course require to be repressed by proper penalties. The primary separation and the *maintenance* of the poorer classes under the circumstances is already provided for under the Sanitary Acts; and our present sanitary laws are, in relation to the poorer classes, defective in their powers of stamping out infectious diseases, merely and mainly in as far as they do not enforce the isolation of the sick by due cautions *after* they are lodged in hospitals or in houses for their reception. No new outlay of money would require to be legalised; but even if required, the expenditure of a few thousand pounds would surely form a small imperial payment for the preservation, yearly, of some thousands of our human population from death, through one

*Isolation
among the
rich;*

*Among the
poor.*

of the most dreaded and loathsome of human diseases. In the eye of the political economist and of the philanthropist, the premature slaughter annually of three or four thousand, or even of three or four hundred, human beings is a loss that cannot be easily estimated by mere yellow gold.

The measure which I have suggested would probably, in my opinion, stamp out small-pox in Great Britain within six months or a year, provided they were carried out as faithfully and universally as the Legislature can command; and if the extirpation of the disease were thus once effected, any fatal case or cases of the return of the malady to any seaport, city, town, village, or country district, would be speedily notified by a machinery already in full operation—viz. the registration of deaths; and all the requisite powers for stamping out the disease in the newly infected locality could at once be set in full operation. All our sanitary acts provide for any instances of this or other infectious disease when introduced into our seaports by ships—ordering the removal of the sick to an hospital or other place for their reception; but in this (as in the case of our own poor in these same hospitals and places), totally forgetting to regulate their due isolation, so that they may not heedlessly sow and scatter round them the seeds of disease and death.

Measures of quarantine and isolation, similar to those I have suggested in the present paper, have been tried elsewhere in the British dominions, and found to answer. At the various ports of South Australia, all entrance to those affected and capable of spreading small-pox has been so well guarded against, that in only one instance—as mentioned to me by Dr. Grainger Stewart—has the disease spread landward into the city of Melbourne, in consequence of an affected individual getting into the town through the misrepresentation of the captain and surgeon of the ship in which he arrived.

*Time to
stamp out.*

*Isolation in
Australia.*

He inflicted the disease upon nearly twenty of the residents. The authorities then interfered, placed all the affected in an inland quarantine station, and the disease spread no further. Thus the malady was at once stamped out.

*Isolation
at sea.*

I have heard of various instances at home in which small-pox was incidentally, rather than methodically, isolated and prevented from spreading in individual households and communities. But let me, as a remarkable instance of this kind, cite a more striking case from naval experience. When a contagious disease appears on board a ship at sea, unless very careful precautions are taken the malady is very liable to spread, in consequence of the crew forming a community cooped up within very narrow limits. These dangers and difficulties are all increased and multiplied, provided—in addition to the crew—there is a crowd of passengers on board. Lately, when in Edinburgh, my friend Dr. Robertson—formerly Medical Officer of Quarantine at Queen's Cliffe, Victoria—related the following instance of the successful isolation of small-pox under such adverse circumstances. A ship sailed from China to Melbourne with 500 unvaccinated Chinese passengers on board. A few days after the ship sailed, an Englishman who had secured a passage fell ill; and his disease turned out small-pox. The vessel was above a month at sea; but in consequence of the small-pox patient being duly isolated, no other cases of the disease occurred. If isolation in small-pox could thus be practised successfully in such a susceptible community as formed the population of this densely crowded naval village or city, surely it could be practised with far greater facility and equal success in our own more open homes and more sparse communities ashore.

*Small-pox
at Puy-
pet.*

In this ship the 500 unprotected Chinese all escaped the contagion. The sudden havoc and destruction which small-pox sometimes produced formerly, and occasionally produces still, in populations altogether unprotected by previous in-

oculation, stands out in strong contrast with the escape of this ship-load of Chinese by the due isolation of the sick. In the narrative of the circumnavigation of the globe by the Austrian frigate Novara, in 1857-59, it is mentioned that in 1854 the English barque Delta arrived at Roankiddi Harbour *Doings of the Delta.* in the Island of Puynipet with one of the crew affected with small-pox. There was some demur about supplying the infected ship with provisions, or allowing its crew to land for that purpose. In the silence of the night the captain of the Delta deposited the sick man on the shore, with all his property, and at day-break made off under full sail. The sick sailor was carefully nursed and tended by the inhabitants of the island, and recovered. But the islanders were sadly repaid for their humanity and charity; for the small-pox speedily broke out with frightful violence among them; and almost every native was attacked. Of 5000 inhabitants, forming the whole population of the island, 3000 succumbed to the virulence of the malady; and many of those that escaped with life showed upon their faces and bodies very visible traces of the effects of the disease. Of thirty white settlers who had all previously been vaccinated, only one was attacked. In the gigantic naval fight of Trafalgar—one of the greatest battles ever fought at sea—between sixteen and seventeen hundred of the British sailors fell. Thus the one infected sailor, cruelly left by the ship Delta upon the shores of Puynipet, destroyed nearly twice as many human lives as were destroyed by all the artillery and musketry fired by the French fleet at Trafalgar.

We cannot, as yet, by artificial prophylactic means, *Prophylactic means.* protect man against an attack of measles, scarlatina, and other contagious diseases, in the same way as we can protect him against the probabilities of an attack of small-pox by vaccination. We can only guard him by quarantine against the arrival of these maladies; and by isolation of the affected,

when once they do break out. Hence those maladies are, like small-pox in unprotected populations, often highly destructive when they do break out in localities or in communities which have not acquired any immunity by having previously passed through the same disease. The introduction and spread of measles a few years ago in the colony of Western Australia is a case in point. I am informed by my pupil, Mr. Page, that towards the latter end of the year 1862 the disease in question was introduced by some persons arriving by the monthly mail steamer which touched at King George's Sound. "As this," he writes me, "was the first attack of measles that had visited the colony; a large proportion of the white inhabitants and all the coloured natives had never before been subject to its influence. The disease spread with such rapidity and fatality that the coloured population in the settled districts was almost swept away by it, a very small number only of those attacked recovering. The whites also suffered severely, many children and adults dying; but the ravages of the disease were not nearly so frightful amongst them as amongst the coloured natives."

*Measles in
Australia.*

In conclusion, I would beg to make one remark. That formidable quaternion of diseases—Small-pox, Scarlatina, Measles, and Hooping-cough—kill annually in Europe above half-a-million of its inhabitants, and particularly of the younger portion of its population;—carrying sorrow and desolation into thousands of households. My observations in the present communication refer especially to the stamping out of Small-pox, for I believe it is the malady whose extirpation could thus most easily be effected. But the same principles apply, and will, I believe, be applied betimes to these other analogous diseases when the science of public health is more advanced,—for the study of it is yet in its infancy. Scarlatina and Measles will become greatly reduced,

*Mortality
from erup-
tive Fevers.*

if not extirpated, by an observance of similar rules. In due course they will be extended to Hooping-cough. Typhus,* Cholera,† and other communicable diseases, will also come to be controlled by their influence. I have already, at the beginning of these observations, stated that during the ten years from 1856 to 1866 above 51,000 individuals had died

*Stamping
out other
Diseases.*

* While correcting the proof of this paper, Dr. Adamson of St. Andrews informed me that some time ago a patient, carrying from a distance the infection of typhus, came to St. Andrews and was laid up there with an attack of the fever. From this primary case the malady spread to others, till several died and a considerable number were laid up with the affection, but recovered. The advent of this infected individual to St. Andrews thus killed and maimed about as many of its inhabitants as were killed and maimed by the late “diabolical explosion” of the barrel of gunpowder or nitro-glycerine against the wall of the prison at Clerkenwell. But how very differently are these two series of human deaths and dangers estimated—and their repetition attempted to be guarded against—by the police, the legislature, and the public!

*Typhus
Fever.*

† In the late epidemic of malignant cholera, much was done in Great Britain in the way of preventing its dissemination in special communities, by removing the sick immediately to hospitals; by placing the still healthy inhabitants of infected houses in other habitations; by fumigating and purifying thoroughly these infected houses; by destroying the clothes and bedding of the sick, etc., etc. Against the possibility of isolating cholera so effectually as we can isolate small-pox and the allied eruptive fevers, there exist several reasons; as—1. It is more difficult, if not indeed impossible, to obtain nurses and attendants for cholera patients who are themselves proof against the malady; for an attack of cholera does not, like an attack of small-pox or measles, produce future immunity from the disease; 2. The cholera poison is more subtle and stealthy in its mode of propagation; for while capable, like small-pox, etc., of being communicated by contiguity, by respiration, etc., cholera is capable also of being communicated by channels additional to those by which small-pox, etc., travel—and particularly by sewage, and by the use of air or water rendered impure by the presence of morbid materials that have passed in the intestinal discharges from the bodies of those suffering from the disease; and 3. The germs or poisons forming the specific diseases, small-pox, measles, etc., never appear to be generated *de novo* (see p. 4). But most pathologists who hold cholera to be decidedly and generally communicated by contagion, hold besides that it is a malady which, in epidemic seasons, is capable also of originating in places without it being possible to trace its development to any previous communication with infected localities or persons.

Cholera.

*Mortality
from crup-
live fevers,
etc.*

of Small-pox in Great Britain ; and, if we calculate approximately from the population, above 12,000 more in Ireland, or upwards of 60,000 in the United Kingdom. In the ten years from 1856 onwards (I have no later data) there died in the United Kingdom from Scarlatina above 280,000 ; from Measles above 130,000 ; and from Hooping-cough above 150,000 ; or about 600,000 of our population were killed off by these four diseases. To what extent can this terrible decennial death-roll be shortened or abolished by the process of isolation and stamping out? Is not the whole subject a grave and momentous question both for Legislators and Physicians?

From 1856 to 1865 the population of the United Kingdom was 28,000,000.

